in a cast-iron socket, which is flanged vertically to give great strength combined with lightness. The cast-iron socket has a small, flat base plate, which enters the ground, but the lateral resistance of the pole is chiefly due to the radial position of the vertical flanges, which press upon an ever-increasing section of the surrounding soil. Messrs. Latimer, Clark, Muirhead, and Co. exhibit a great variety of telegraphic apparatus, part made by themselves, and part by the Western Electric Manufacturing Company of Chicago. Certain of the American sounders are models of neat workmanship and compact device. While upon the subject of sounders, which are the most promising of telegraphic receivers at present, we may mention the bell-sounder of Sir Charles Bright, exhibited on the stall of Mr. E. B. Bright, C.E. The hammer of this ingenious little instrument strikes upon two musical brass tubes of different pitch and so gives out a much pleasanter sound than the tapping of the ordinary sounder.

The number of wire and cable manufacturers who exhibit at the Crystal Palace is considerable, and there are signs of great activity in this department, especially for telephonic and electric lighting purposes. We have only to deal with land lines at present, and may mention the excellent specimen of galvanised iron telegraph wire exhibited by Messrs. Johnson and nephew, and Mr. Walter T. Glover, of Manchester, and others. The chief novelty in land wires is the use of phosphor bronze for telephonic lines. This alloy is very strong and conductive, so that much smaller wires are required than when iron is used. Moreover, it withstands the chemical action of atmosphere better, and is less exposed to storms. Its use, however, has not become at all general; and this is partly due to its great elasticity, rendering it difficult to put up. Specimens of this wire are shown by the Phosphor Bronze Company, of Sumner Street, London.

In insulators the pattern exhibited by Messrs. Johnson and Phillips is deserving of notice. As illustrated in the figure, it consists of a porcelain bell A, curved inwards to form an oil-well S, which is filled with a fluid insulator, such as paraffin. P is the bolt of the insulator, which supports it from the bracket of the pole. As a film of dew or rain cannot form on the surface of the insulating oil, the insulation resistance of this insulator is said to be many hundred times higher than that given by the ordinary insulators in use, and what is perhaps of more consequence, it is far more constant.

The tendency of the time is for overhead telegraph wires to give place to underground ones, as they have in Germany. Underground wires are less subject to accident from violence or storms, and hence are easily maintained in good condition. Trunk subterranean lines are about to be laid in England by the Post Office, and there are signs that the existing telephone lines will ere long have to be superseded by wires laid under the streets. For this purpose the box curb of Mr. W. Reddall, exhibited in the Western Gallery, may be useful. The idea is to make the curb of the pavement in the form of an iron box in proper lengths, and lay the wires in it; the lid being removable at will for inspection. The strong earthenware jointed pipes made by Messrs. Doulton and Co., of Lambeth, for holding subterranean wires, are also worthy of remark.

NOTES

PROF. E. RAY LANKESTER, F.R.S., has been appointed to the Chair of Natural History in the University of Edinburgh, in succession to the late Sir C. Wyville Thomson.

THE Senatus Academicus of Edinburgh University have resolved to offer the honorary degree of Doctor of Laws to Mr. John Simon, F.R.S., late medical adviser to the Privy Council; Dr. Angus Smith, F.R.S.; and Mr. Joseph Anderson, secretary to the Society of Antiquaries, Edinburgh. The degrees will be conferred with the ordinary examination degrees in arts, sciences, and divinity at the graduation ceremonial to be held on April 21.

THE President of the Linnean Society, Sir John Lubbock, held a reception at the Society's rooms at Burlington House on Tuesday last. The guests began to arrive at nine o'clock, and were received in the Library by the president and officers. Prominent amongst the objects exhibited was a striking portrait of Mr. Charles Darwin, painted for the Society by Mr. John Collier, and allowed by all to be the best portrait extant of our great naturalist. Carnivorous plants were strongly represented amongst the large contributions of plants from the Royal Gardens, Kew, and the leading nurserymen; in addition there were many fine specimens shown for their ornamental qualities. In the glass cases of the Library there were exhibited manuscripts of Linnæus, and medals struck in his honour; Wedgwood medallions of scientific men (lent by Sir Joseph Hooker); a series of caddis-flies, shown by Mr. R. MacLachlin; dredging apparatus, &c., by Mr. H. C. Sorby; new drugs by Mr. Thomas Christy; and Sikkim Rhododendrons, by Mr. J. H. Mangles. In the galleries was placed a series of cases of crustacea and insects, exhibited by Mr. J. T. Carrington; and in the Council Room a set of drawings of pollen, made by Mr. Charles White. The rooms were well filled during the evening, and among the visitors were many men distinguished in various departments of science.

THE following are the lecture arrangements of the Royal Institution after Easter:—Mr. E. B. Tylor, four lectures on the History of Customs and Beliefs, on Tuesdays, April 18 to May 9; Prof. A. Gamgee, four lectures on Digestion, on Tuesdays, May 16 to June 6; Prof. Dewar, eight lectures on the Chemical and Physical Properties of the Metals, on Thursdays, April 20 to June 8; Mr. F. Pollock, four lectures on the History of the Science of Politics, on Saturdays, April 22 to May 13; and Prof. D. Masson, on Poetry and its Literary Forms, on Saturdays, May 30 to June 10. The Friday evening meetings will be resumed on April 21, when Prof. Dewar will give a discourse on the Experimental Researches of Henri Ste Claire Deville.

THE following are among the papers announced to be read at the meeting of the Institution of Naval Architects to-day and to-morrow:—The revision of the tonnage laws, by W. H. White; on tonnage measurement and moulded depth in relation to freeboard, by W. W. Rundell; on the basis for fixing suitable load lines for mercantile steamers and sailing vessels, by B. Martell; on launching velocities, by W. Denny, F.R.S.E.; on the transverse strains of iron merchant vessels, by Messrs. P. Jenkins and T. C. Read; on progressive speed trials, by J. H. Biles; on curves of stability of some mail steamers, by J. H. Biles; approximate formulæ for the calculation of trim, by M. J. A. Normand; on the reduction of transverse and longitudinal metacentric curves to ratio curves, by W. Denny, F.R.S.E.

ON Tuesday evening, at the Royal College of Physicians, a large representative meeting of both branches of the medical profession was held, with a view, in face of organised opposition to the progress of scientific research, of taking steps to "bring the legitimate influence of the medical profession more effectively to bear on the promotion of those exact researches in physiology, pathology, and therapeutics which are essential to sound progress in the healing art." Sir William Jenner presided. The chairman pointed to the fact that at the present time there was no society to guide and protect research, and stated that it was intended to found the proposed society on a broad basis. He declared that it was not proposed to attempt to abrogate the existing law on research; but it was intended to watch the operation of the law, and to see that there were no delays in important cases. He referred, as an instance of the

dangerous delays which occurred in granting licenses to the late poisoning case tried at the Old Bailey. The society proposed to be formed could, on the one hand, will bring its influence to bear to restrain those ardent pursuers of science who did not regard the susceptibilities of the public, and, on the other, it could enlighten the public, and so lessen the morbid sensibilities which had been aroused. He then proposed that the society should be formed; the motion was supported by the Master of the Rolls, who wished "God speed" to those engaged in research for the alleviation of human suffering. The motion was carried *nem. con.* The president of the Royal Society, Mr. Spottiswoode, seconded by Dr. Quain, proposed that the association should be formed of representative members of the profession and others, and this was carried. Sir James Paget, Sir William Gull, Sir Risdon Bennett, Sir J. Lubbock, and others proposed and supported resolutions on matters of detail.

IT is probable that the Observatory of Popular Astronomy established by a decree of M. Paul Bert in the Trocadero Palace, Paris, will be transferred into a general institute for popular education. The appointments gazetted by M. Paul Bert on the very day on which he left the Ministry will be declared void, and other appointments are to take place to meet the requirements of the enlarged institution. Since he resigned his seat in the Cabinet, M. Barthelemy St. Hilaire has resumed his great work of translating Aristotle. Up to the time of his appointment twenty-four volumes had been published by him. The matter in hand will fill not less than twenty-six volumes, and is mostly confined to the natural history. Two volumes on the Habits of Animals will be published before the end of the year, and the others are to follow in quick succession. The last volumes will be devoted to Problemata and Fragmenta. A copious index will be the crowning part of this magnificent publication.

AT the meeting of the Royal Dublin Society, held on the 20th inst., Prof. Hull, F.R.S., laid before the "Natural Science Section" a series of 28 maps of the British Isles and the adjoining parts of the European continent, to which he has given the name of Palæo-geological and Geographical Maps. With the exception of the last three of the series, the maps are in duplicate. On one is represented by colour the position of each geological formation (or group of formations), and by a lighter shade of the same colour is shown the area under which this formation is considered to extend beneath more recent strata. On the corresponding duplicate an attempt is made to restore the "palæo-geography" of the period represented by the formation in question—the land being represented by shades of brown, the sea by those of blue, according to the heights in one case, and the depths in the other. The formations treated in this manner are: 1, the Laurentian; 2, the Cambrian; 3, the Lower Silurian; 4, the Upper Silurian and Devono-Silurian (or Lower Old Red Sandstone); 5, the Devonian; 6, the Old Red Sandstone and Lower Carboniferous; 7, the Upper Carboniferous; 8, the Permian; 9, the Trias; 10, the Lias and Oolite (Jurassic); 11, the Cretaceous; 12, the Tertiary (Eocene and Miocene); 13, the Post-Pliocene or Glacial, in three maps. The above grouping was found to be the most convenient for representation, and the colours used for the formations are those of the Geological Survey. Some very interesting results are brought out respecting the physiography of past geological times, including the probable position of the old continent of Atlantis, which the author considers to have existed in Laurentian, Cambrian, and Lower Silurian epochs. The recent borings for coal, or water, under the Cretaceous and other strata of the south and centre of England, have enabled the author to show with much precision the structure of these districts; and he places a possible coal-basin under the margin of the North Downs and the Wealden area, thus agreeing with the views long since stated by Mr. Godwin-Austen.

VIENNA is to have its Exhibition of Electricity in the coming autumn. A committee has been formed, under the presidency of Count Hans Wilczek. The Board of Trade has offered the committee every support.

COL. BURNABY made a successful balloon trip across the Channel on Thursday last. He was alone, and had a large load of ballast, by judicious expenditure of which he was able to avail himself of favourable air-currents. He left Dover at 10.35 a.m., and came to ground about eighteen miles beyond Dieppe late in the afternoon. His greatest altitude seems to have been 11,000 feet.

A RECENT number of the *Celestial Empire*, referring to a discovery of some ancient graves near Shanghai, gives an interesting account of Chinese burial in former times. A man of means purchased his coffin when he reached the age of forty. He would then have it painted three times every year with a species of varnish, mixed with pulverised porcelain—a composition which resembled a silicate paint or enamel. The process by which this varnish was made has now been lost to the Chinese. Each coating of this paint was of some thickness, and when dried had a metallic firmness resembling enamel. Frequent coats of this, if the owner lived long, caused the coffin to assume the appearance of a sarcophagus, with a foot or more in thickness of this hard, stone-like shell. After death the veins and the cavities of the stomach were filled with quicksilver for the purpose of preserving the body. A piece of jade would then be placed in each nostril and ear, and in one hand, while a piece of bar silver would be placed in the other hand. The body thus prepared was placed on a layer of mercury within the coffin; the latter was sealed, and the whole then committed to its last resting-place. When some of these sarcophagi were opened after the lapse of centuries, the bodies were found in a wonderful state of preservation; but they crumbled to dust on exposure to the air. The writer well observes that the employment of mercury by the Chinese of past dynasties for the purpose of preserving bodies ought to form an interesting subject for consideration and discussion in connection with the history of embalming and "mummy making."

THE return of works licensed to be printed during the past two years by the Japanese Department of the Interior is of much interest as showing the tendency of the minds of educated people of the country. The figures show that considerable mental activity exists in the country. Last year 545 works on political subjects were issued, against 281 the previous year. Law was represented by 255 works against 207 in 1880; while in political economy the numbers were 25 and 15 respectively. Geographical works declined from 170 in 1880 to 164 in 1881; while in medicine the increase was from 229 to 267. In scientific subjects we find 25 works on chemistry, and 22 on natural history in 1880, reduced 17 and 20 respectively in 1881. Natural philosophy also shows a decline from 19 to 13; so do mathematics from 116 to 107. Similarly works on astronomy have declined from 9 in 1880 to 7 in 1881. In other classes of books, however, we find a great increase. Ethical and moral works have increased from 32 to 93; historical works from 196 to 276; books on poetry and poetical works from 491 to 556; books on drawing and writing from 127 to 339. Engineering works have increased from 8 to 28; and books on commerce from 70 to 113. School-books again this year are nearly half as numerous as all other books put together, numbering 704 against 707 last year. Lighter literature is by no means neglected, for 193 volumes of tales, novels, &c., were published during 1881. During the year 149 new newspapers started, but the large proportion of 114 never saw the commencement of the present year. In 1880 the publication of 266 new journals commenced, 47 of which soon succumbed. The operation of the press laws cannot be very stringent, when we find that during two years, of 415 newspapers,

161 of which ceased, only one was prohibited by the Government. In addition to those above-mentioned, we find in the list works on etiquette, accounts, naval and military works, dictionaries, encyclopædias, &c. The total number of works published during the year was 4910 against 3792 last year. Very many of these books are translations or adaptations of European or American works. Among such books recently "conveyed" we find Smiles's "Character," Roscoe's "Chemistry," Leone Levi's "International Commercial Law," Bouvier's "Law Dictionary," Palgrave's "Chairman's Handbook," Lord Chesterfield's "Letters," "Every Man his own Lawyer," Taylor's "Medical Jurisprudence," Thompson's "Social Science and National Economy," Baxter's "London Statistics," "The Science of Familiar Things," Mill's "Three Essays on Religion," Draper's "Conflict of Religion and Science," portions of Buckle's "History of Civilisation," Thompson's "Outline of the Necessary Laws of Thought," &c. As to the price of these works, we may instance Smiles's "Character," the translation of which by Nakamura, a well-known English scholar, in two volumes, costs only 50 *sen*, or about a shilling at the present rate of the paper currency. The figures and facts here recorded show at least that the path of western progress which the Government is pursuing, is one in which the people desire to take a part.

WE have received from the President of the University of Tokio a copy of the calendar of that Institution for the past year. It is printed in Japanese and English, and thus appears somewhat more bulky than its actual contents would warrant. In the preface, a brief account is given of the growth of this large and apparently flourishing establishment from its first small commencement as a bureau for translating foreign books. We have heard so much recently of the changes in the *personnel* of the Japanese educational institutions from foreign to native teachers, that we turn with some interest to the list of professors. In the department of law we find one foreign and eight native teachers (including in this term professors, lecturers, instructors, &c.). This subject is exceptional, as there are five professors of Japanese law. In science, of the twenty-six teachers, eighteen are natives, and we believe this number has increased recently; and in literature three of the fourteen teachers are foreigners. Judging simply by the degrees which they have obtained in western universities, most of the Japanese gentlemen seem well qualified for their work. This great and rapid displacement of foreign instructors is certainly a delicate experiment, and we can only hope that it may be successful. *Chi va piano va sano* is a motto which may be commended to Japanese attention in this respect as in many others. The students can hardly complain of excessive charges. The tuition fee for each term (of which there are three in the year) is only four *yen*, nominally 16*s*., but at the present rate of the currency rather less than 9*s*.; while the cost for a term of living, fire, light, &c., is only fourteen *yen*, or about 32*s*. The total number of students attending the college is 205. The examination papers, which are given in full, seem to be quite up to the standard for similar examinations in this country. We are glad to observe that Japanese literature and history are not neglected in the study of more western subjects. A large number of teachers have been provided for these subjects.

PROF. CIVIALE is preparing a large photographic work on the Alps. For ten years, from 1859 to 1868, the author travelled in the Alps with his camera, constantly taking panoramic and smaller (detailed) views. The latter, some 600 in number, principally show the glaciers with their crevasses, moraines, and the rocks forming their banks, the mountains, valleys, glens, natural geological sections, the rocky eminences groved, polished, or ground by former glaciers, and the course of various rivers. The panoramic views, forty-one in number, are taken from the summits, and comprise all the large Alpine chains. Each consists of a number of plates, and twenty include the whole circle of view. These valuable plates are accompanied by two maps in 1 : 600,000, one is specially orographical, the other shows the curves of the panoramic views. Thirteen years were necessary to put the material collected into proper order, to replace the photographic plates by printed ones, to draw and engrave the maps, and to write the text.

THE recent remarkably low level of nearly all the Swiss lakes has encouraged the scientific circles of Switzerland to make fresh researches with regard to pile-dwellings. The societies of the Canton of Thurgau have investigated the Untersee (the lower part of the Lake of Constance), near Steckborn, in the vicinity of the former monastery of Feldkirch. The Untersee was surrounded by a complete circle of pile-dwellings, and the present investigations have yielded valuable results, in the shape of a long list of the most varied objects which have been brought to light.

THE Russian Society of Painters has started a new publication, which will be of interest, not only for lovers of the Fine Arts, but also for science. It is a periodical, "Art in Central Asia," being a collection of well printed drawings of Central Asian architectural ornaments, carpets, paintings, and so on, published under the supervision of M. Simakoff and of the above-named society.

WE learn with pleasure that a special "Geological Committee" has been instituted in Russia, at the Department of Mines, for a systematic geological exploration of Russia, and for the preparation of a detailed geological map of the country. The Government has allowed an annual grant of 3000*l*. for the expenses of the Committee and for its publications.

DR. RAE points out that, according to the Royal Geographical Society's *Journal*, the late Pundit Nain Singh was awarded not the Royal Medal, but a gold watch.

WE have been requested to state that the late Dr. T. Romney Robinson was born in the year 1792, and not in 1793, as stated erroneously in the obituary notice which recently appeared in our columns.

THE additions to the Zoological Society's Gardens during the past week include two Bonnet Monkeys (*Macacus radiatus* ♀ ♀) from India, presented respectively by Mr. Henry Worth and Mrs. Nicholson; three Herring Gulls (*Larus argentatus*), British, presented by Mr. Rowland Ward; a Herring Gull (*Larus argentatus*), British, presented by the Chevalier Da Costa Ricci; a Sclater's Curassow (*Crax sclateri* ♂), a King Vulture (*Gypagus papa*) from the Province of Alagoas, Brazil, presented by Mr. Frederick Youle; a Puffin (*Fratercula arctica*), British, presented by Mr. H. M. Upcher; two Grey Ichneumons (*Herpestes griseus* ♂ ♀) from India, two Tayras (*Galictis barbara*) from Brazil, a Wild Boar (*Sus scrofa*), European, deposited.

OUR ASTRONOMICAL COLUMN

THE GREAT COMET OF 1881.—In the *Monthly Notices* of the Royal Astronomical Society for January there are published two letters addressed to the secretaries by Dr. W. Bone of Castlemaine, Victoria, referring to an object seen near the great comet of last year, on the evening of June 10. In a telegram which he sent to the Melbourne Observatory the same night, he described it as discoid and like a circular comet, and states it had travelled south 6′ in thirty-four minutes; its place at 6h. 45m. in R.A. 5h. 18m 30s., Decl. −14° 24′. He asked that search might be made at Melbourne, but mentions that his telegram was not answered. In his first letter he writes: "On June 10, 1881, whilst measuring the position of the comet, then visible here at 5h. 52m. mean time of place, I noticed a peculiar discordance in each succeeding measure, and at length found that the star (?) from which I was measuring was a rapidly-moving body." He found it "somewhat discoid, but its light, although bright, was